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Specifications For ATC 810

1. The Flight Simulator shall be designed using the latest state of the art in solid state digital and Analog Hybrid Computer technology with its own dedicated Microprocessor controlled system with self-contained diagnostic capabilities. The simulators performance and flying qualities shall be similar to those of a 6500-8000 Cabin Class Twin-Engine Aircraft.

2. Features to include:

- A. Flight Performance both above and below V_{mc} .
- B. Servo controlled control pressure feedback as a function of airspeed.
- C. Rate of turn proportional to angle of bank and inversely proportional to airspeed.
- D. Functional trim to remove control pressures in the pitch, roll and yaw axis.
- E. Service ceiling to at least FI240.
- F. Engine start and restart sequence in-flight and on ground.
- G. Fuel management including cross feed capabilities.
- H. Take-off and landing modes.
- I. Independent engine feathering.
- J. Full IFR navigational capability - including ability to use up to 4 150 NM x 150 NM areas which exactly duplicates that particular IFR navigational area.
- K. Instructor-fault Concolle which includes the following fault features:

- Asymmetrical Flaps
- Landing Gear Inoperative
- Propeller Over/Under Speed
- Cylinder Head Temperature Over/Under
- Loss of Oil Pressure
- Loss of Fuel Pressure
- Gyro Pressure Malfunction
- Wind Direction and Velocity Control
- Turbulence Control
- Icing-Wing
- Icing-Pitot Head

L. Annunciator warning light panel to include:

- Flap Condition
- Left Pneumatic System
- Right Pneumatic System
- Left Boost Pump Low Pressure
- Right Boost Pump Low Pressure
- Left Fuel Flow - Low
- Right Fuel Flow - Low



- Left Alternator Inoperative
- Right Alternator Inoperative
- Cabin Door Ajar
- Baggage Door Ajar
- No Smoking
- Seat Belt
- M. Realistic engine out and emergency procedures.
- N. L.E.D. displays for radio frequencies.
- O. Sounds
 - 1. OM/MM/IM Coded Audio
 - 2. Twin Engine sounds - prop sync
 - 3. Stall Warning Horn
 - 4. Gear Warning Horn
- P. Differential thrust control
- Q. Toe brakes
- R. Gear-in-transit and down-and-locked lights
- S. Verify field in sight mode
- T. 3 Dimension aircraft position preset
- U. 3 Dimention and aircraft attitude freeze mode.
- V. Instant flight set-up mode
- W. Cockpit enclosure
- X. Pilot seat
- Y. Instructor seat
- Z. Lighted instrument panel - post lights for each instrument
- AA. X/Y Plotter - provides an exact ground track of the course flown by the pilot on the applicable Low Altitude Charts.
- BB. The following minimum equipment and/or indicators should be installed on the simulator and Instructor-fault Console:

PILOT CONTROLS: Control column Rudder pedals Throttle controls Propeller controls Mixture controls Elevator trim Roll trim Rudder trim Fuel shut-off Crossfeed selector Fuel selector-inboard/outboard Split master/alternator switch Magneto switches Start switch Fuel pump switches Landing gear selector Flap control selector Cowl flaps control Circuit breakers for	FLIGHT INSTRUMENTS: Airspeed indicator (TAS) Turn coordinator Attitude indicator Heading indicator Vertical speed indicator Altimeter Magnetic compass ENGINE GAUGES: Dual manifold pressure Dual RPM Dual EGT Dual fuel pressure Dual Fuel Flow Dual oil pressure Dual CHT Dual oil temperature Two fuel gauges Gyro pressure gauge
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appropriate electrical equip.
Pitot heater switch
De-icing control switches
Key lock
Parking brake
Push-to-test lamp verification
Engine audio volume
Panel lights adjustments

RADIO/NAV EQUIPMENT

Digital DME
RMI indicator/ADF indicator
VOR/ILS head
Clock/lapse time
Audio marker beacon receiver
ADF receiver
2 200-channel NAV receivers
720-channel COM radio
4096-code transponder
Audio control panel
Mike and earphone jacks
2 head sets with boom mikes
Push-to-talk button on pilot yoke
Lapse-time meter (Hobbs)
Horizontal Situation Indicator
provides continually slaved gyro.
Magnetic heading, VOR, LOC, &
Glide Slope in single display

Ammeter
ANNUNCIATOR WARNING PANEL:
Flap condition
Left Pneumatic
Right Pneumatic
Left Boost Pump
Right Boost Pump
Left Fuel Flow
Right Fuel Flow
Left Alternator Inoperative
Right Alternator Inoperative
Cabin
Baggage
No Smoking
Seat Belt

INSTRUCTOR FAULT CONSOLE:

Asymmetrical Flaps
Landing Gear Inoperative
Propeller Over/Under Speed
Cylinder Head Temperature
Over/Under
Loss of Oil Pressure
Loss of Fuel Pressure
Gyro Pressure Malfunction
Wind Direction and Velocity
Control
Turbulence Control
Icing-Wing
Icing-Air Induction
Icing-Pitot Head
Microphone and Earphone Jacks

OPTIONS:

Flight Plotter

CC. Capable of accepting a Visual Display System with takeoff and landing capability.

3. The simulator design, programming, and control integration should provide at least the following teaching capabilities:

GENERAL

Basic Instrument Scan
Attitude Instrument Flight
ADF, VOR, LOC Tracking
ADF, VOR, LOC Holding Patterns

NAVIGATIONAL CAPABILITIES

Enroute
ADF tracking
VOR tracking

VOR/DME Intersection Holding
DME Arcs

ATC Procedures
ATC communications and radio procedures
Partial Panel Procedures
Takeoffs and Landings
Missed Approach Procedures
Normal and Steep Turns
Climbs/Descents
Slow Flight
Stall and Recoveries
Cockpit Procedures
Cross-Country Procedures
Orientation Problems
Diversions to Alternate Airports
Holding Pattern Flying
Wind Correction Angle
All Instrument Approaches
Rough Air Operations
Flight Freeze Mode

EMERGENCY AND ENGINE INOPERATIVE PROCEDURES

Engine feathering and securing procedures
Engine failure before rotation
Engine failure during takeoff
Engine failure during climb
Engine failure above V_{mc}
Maneuvering with one engine inoperative
Engine out approaches
Landing gear not locked UP or DOWN
Wing icing
Air induction icing
Pitot head icing
Asymmetrical flap condition
Pneumatic system problems
Fuel boost pumps (one or both) inoperative
Oil pressure problems
Cylinder head temperature problems
Propeller sync problems (over and under speed)
Fuel flow interruptions

VOR/DME tracking
Dual NAV'S allow position fixing
Track all airways

Fly preferred routes
SID (Departures)
STARs (Approaches)

Approaches
ADF approaches
VOR approaches
VOR/DME approaches
DME arc approaches
Localizer approaches
Localizer Back Course approaches
SDF approaches
ILS approaches
ILS Back Course approaches
Category II ILS approaches